**3GPP TSG-SA5 Meeting #137eS5-213399**

**10 May to 19 May 2021, E-meeting**

|  |
| --- |
| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
|  |
|  | **28.541** | **CR** | **0506** | **rev** | **1** | **Current version:** | **17.2.1** |  |
|  |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
|  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network | **x** | Core Network | **x** |

|  |
| --- |
|  |
| ***Title:***  | Correction of 5QI definitions in NRM |
|  |  |
| ***Source to WG:*** | Ericsson |
| ***Source to TSG:*** | S5 |
|  |  |
| ***Work item code:*** | adNRM |  | ***Date:*** | 2021-05-08 |
|  |  |  |  |  |
| ***Category:*** | C |  | ***Release:*** | Rel-17 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)Rel-12 (Release 12)**Rel-13 (Release 13)Rel-14 (Release 14)Rel-15 (Release 15)Rel-16 (Release 16)**Rel-17 (Release 17)* |
|  |  |
| ***Reason for change:*** | In cases where there is need to augment the 5QI characteristics (e.g. vendor or domain exensions) the current NRM, which uses datatypes to define the 5QI characteristics, is not extensible. |
|  |  |
| ***Summary of change:*** | Convert the 5QI characteristics datatype to IOC to allow for extensions. |
|  |  |
| ***Consequences if not approved:*** | The current 5QIs can not be extended in a consistent and compatible way. |
|  |  |
| ***Clauses affected:*** | 4.2, 5.2, 5.3.75, 5.3.94, 5.4, H.5.30, H.5.33 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **x** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** |  | **x** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **x** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** | Forge link:[https://forge.3gpp.org/rep/sa5/MnS/tree/S5\_213399\_Rel\_17\_CR\_28.541\_Correction\_of\_Dynamic5QISet\_definition](https://forge.3gpp.org/rep/sa5/MnS/tree/S5_213399_Rel_17_CR_28.541_Correction_of_Dynamic5QISet_definition/yang-models) |
|  |  |
| ***This CR's revision history:*** |  |

|  |
| --- |
| **1st modified section** |

The Figure 4.2.1.1-8 shows the NRM fragment for pre-configured 5QIs in NG-RAN.



Figure 4.2.1.1-8: NRM fragment for pre-configured 5QIs in NG-RAN

|  |
| --- |
| **Next modified section** |

The Figure 5.2.1.1-20 shows the NRM fragment for dynamically assigned 5QIs in 5GC.



Figure 5.2.1.1-20: NRM fragment for dynamically assigned 5QIs in 5GC

|  |
| --- |
| **Next modified section** |

### 5.3.75 Configurable5QISet

#### 5.3.75.1 Definition

This IOC contains pre-configured 5QIs, including their QoS characteristics, see 3GPP TS 23.501 [2].

#### 5.3.75.2 Attributes

The Configurable5QISet IOC includes attributes inherited from Top IOC (defined in TS 28.622[30]).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Support Qualifier | isReadable | isWritable | isInvariant | isNotifyable |
|  |  |  |  |  |  |

#### 5.3.75.3 Attribute constraints

None.

#### 5.3.75.4 Notifications

### The common notifications defined in subclause 5.5 are valid for this IOC, without exceptions or additions.

|  |
| --- |
| **Next modified section** |

### 5.3.94 Dynamic5QISet

#### 5.3.94.1 Definition

This IOC contains dynamically assigned 5QIs including their QoS characteristics, see 3GPP TS 23.501 [2]. The instance of this IOC shall not be created or modified by the MnS consumer except for the instance associated to PCFFunction MOI or SMFFunction MOI when the PCF is not deployed.

#### 5.3.94.2 Attributes

The Dynamic5QISet IOC includes attributes inherited from Top IOC (defined in TS 28.622[30]).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Support Qualifier | isReadable | isWritable | isInvariant | isNotifyable |
|  |  |  |  |  |  |
|  |

#### 5.3.94.3 Attribute constraints

None.

#### 5.3.94.4 Notifications

The common notifications defined in subclause 5.5 are valid for this IOC, without exceptions or additions.

|  |
| --- |
| **Next modified section** |

## 5.4 Attribute definitions

### 5.4.1 Attribute properties

The following table defines the attributes that are present in several Information Object Classes (IOCs) of the present document.

| Attribute Name | Documentation and Allowed Values | Properties |
| --- | --- | --- |
| aMFIdentifier | The AMFI is constructed from an AMF Region ID, an AMF Set ID and an AMF Pointer. The AMF Region ID identifies the region, the AMF Set ID uniquely identifies the AMF Set within the AMF Region, and the AMF Pointer uniquely identifies the AMF within the AMF Set. (Ref. 3GPP TS 23.003 [13]) | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: N/AisNullable: False |
| aMFSetId | It represents the AMF Set ID, which is uniquely identifies the AMF Set within the AMF Region.allowedValues: defined in subclause 2.10.1 of 3GPP TS 23.003 [13]. | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: N/AisNullable: False |
| aMFSetMemberList | It is the list of DNs of AMFFunction instances of the AMFSet. allowedValues: N/A | type: DNmultiplicity: 1isOrdered: N/AisUnique: TruedefaultValue: NoneisNullable: False |
| aMFRegionId | It represents the AMF Region ID, which identifies the region.allowedValues: defined in subclause 2.10.1 of 3GPP TS 23.003 [13]. | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: N/AisNullable: False |
| localAddress  | This parameter specifies the localAddress including IP address and VLAN ID used for initialization of the underlying transport.First string is IP address, IP address can be an IPv4 address (See RFC 791 [37]) or an IPv6 address (See RFC 2373 [38]).Second string is VLAN Id (See IEEE 802.1Q [39]). | type: Stringmultiplicity: 2isOrdered: TrueisUnique: N/AdefaultValue: NoneisNullable: False |
| remoteAddress | Remote address including IP address used for initialization of the underlying transport.IP address can be an IPv4 address (See RFC 791 [37]) or an IPv6 address (See RFC 2373 [38]). | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| nfProfileList | It is a set of NFProfile(s) to be registered in the NRF instance. NFProfile is defined in 3GPP TS 29.510 [23]. | type: <<dataType>>multiplicity: \*isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: N/AisNullable: False |
| cNSIIdList | It is a set of NSI ID. NSI ID is an identifier for identifying the Core Network part of a Network Slice instance when multiple Network Slice instances of the same Network Slice are deployed, and there is a need to differentiate between them in the 5GC, see clause 3.1 of TS 23.501 [2] and subclause 6.1.6.2.7 of 3GPP TS 29.531 [24].  | type: Stringmultiplicity: \*isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: N/AisNullable: False |
| sNSSAIList | See subclause 4.4.1. |  |
| sBIFQDN | It is used to indicate the FQDN of the registered NF instance in service-based interface, for example, NF instance FQDN structure is:nftype<nfnum>.slicetype<sliceid>.mnc<MNC>.mcc<MCC>.3gppnetwork.org | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: N/AisNullable: False |
| sBIServiceList | It is used to indicate the all supported NF services registered on service-based interface. | type: Stringmultiplicity: \*isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: N/AisNullable: False |
| nRTACList | It is the list of Tracking Area Codes (either legacy TAC or extended TAC). allowedValues:Legacy TAC and Extended TAC are defined in clause 9.3.3.10 of TS 38.413 [5]. | type: Integermultiplicity: 1..\*isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: N/AisNullable: False |
| supportedBMOList | It is used to indicate the list of supported BMOs (Bridge Managed Objects) required for integration with TSN system. | type: Stringmultiplicity: \*isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: N/AisNullable: False |
| managedNFProfile | This parameter defines profile for managed NF (See TS 23.501 [22]). allowedValues: N/A | type: ManagedNFProfilemultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: N/AisNullable: False |
| nfInstanceID | This parameter defines unique identity of the NF Instance. The format of the NF Instance ID shall be a Universally Unique Identifier (UUID) version 4, as described in IETF RFC 4122 [44]allowedValues: N/A | type: Stringmultiplicity: 1isOrdered: FisUnique: N/AdefaultValue: NoneisNullable: False |
| nfType | This parameter defines type of Network FunctionallowedValues: See TS 23.501[22] for NF types | type: ENUMmultiplicity: 1..\*isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| Fqdn | This parameter defines FQDN of the Network Function (See TS 23.003 [5])allowedValues: N/A | type: Stringmultiplicity: 1isOrdered: FisUnique: N/AdefaultValue: NoneisNullable: False |
| ipAddress | This parameter defines IP Address of the Network Function. It can be IPv4 address (See RFC 791 [37]) or IPv6 address (See RFC 2373 [38]).allowedValues: N/A | type: Stringmultiplicity: 1isOrdered: FisUnique: N/AdefaultValue: NoneisNullable: False |
| authzInfo | This parameter defines NF Specific Service authorization information. It shall include the NF type (s) and NF realms/origins allowed to consume NF Service(s) of NF Service Producer (See TS 23.501[22]). allowedValues: N/A | type: Stringmultiplicity: 1isOrdered: FisUnique: N/AdefaultValue: NoneisNullable: True |
| Locality | The parameter defines information about the location of the NF instance (e.g. geographic location, data center) defined by operator (See TS 29.510[23]).allowedValues: N/A | type: Stringmultiplicity: 1isOrdered: FisUnique: N/AdefaultValue: NoneisNullable: True |
| Capacity | This parameter defines static capacity information in the range of 0-65535, expressed as a weight relative to other NF instances of the same type; if capacity is also present in the nfServiceList parameters, those will have precedence over this value (See TS 29.510[23])allowedValues: 0-65535 | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: N/AisNullable: False |
| nFInfo | This parameter includes NF specific data in Managed NF profileallowedValues: N/A | type: NFInfomultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: N/AisNullable: False |
| hostAddr | This parameter defines host address of a NFallowedValues: N/A | type: HostAddrmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: N/AisNullable: False |
| Priority | This parameter defines Priority (relative to other NFs of the same type) in the range of 0-65535, to be used for NF selection; lower values indicate a higher priority. If priority is also present in the nfServiceList parameters, those will have precedence over this value (See TS 29.510[23]).allowedValues: 0-65535 | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: N/AisNullable: False |
| supportedDataSetIds | This parameter defines list of supported data sets in the UDR instance (See TS 29.510[23]).allowedValues: "SUBSCRIPTION", "POLICY", EXPOSURE", "APPLICATION" | type: ENUMmultiplicity: 1..\*isOrdered: N/AisUnique: FalsedefaultValue: NoneisNullable: False |
| nFSrvGroupId | This parameter defines identity of the group that is served by the NF instance (See TS 29.510[23]).allowedValues: N/A | type: Stringmultiplicity: 1isOrdered: FisUnique: N/AdefaultValue: NoneisNullable: False |
| smfServingAreas | This parameter defines the SMF service area(s) the UPF can serve (See TS 29.510[23]).allowedValues: N/A | type: Stringmultiplicity: 1..\*isOrdered: FisUnique: TruedefaultValue: NoneisNullable: False |
| isESCoveredBy | This indicates whether the adjacentCell provides no, partial or full coverage for the cell which name-contains the NRCellRelation instance. Adjacent cells with this attribute equal to "FULL" are recommended to be considered as candidate cells to take over the coverage when the original cell state is about to be changed to energySaving.All adjacent cells with this attribute value equal to "PARTIAL" are recommended to be considered as entirety of candidate cells to take over the coverage when the original cell state is about to be changed to energySaving.allowedValues: NO, PARTIAL, FULL | type: ENUMmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| commModelList | The attribute specifies a list of commModel which is defined as a datatype (see clause 5.3.69). It can be used by NF and NF services to interact with each other in 5G Core network (see TS 23.501 [2]).allowedValues: Not applicable | type: commModelmultiplicity: 1..\*isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| groupId | This parameter identiies a list of target NF services on which the same communication model is applied to. allowedValues: N/A | type: Integermultiplicity: 1isOrdered: N/AisUnique: FalsedefaultValue: NoneisNullable: False |
| commModelType | This parameter defines communication model used by a NF to interact with NF service(s) (See TS 23.501 [2]). allowedValues:”DIRECT\_COMMUNICATION\_WO\_NRF”, “DIRECT\_COMMUNICATION\_WITH\_NRF”, “INDIRECT\_COMMUNICATION\_WO\_DEDICATED\_DISCOVERY”, “INDIRECT\_COMMUNICATION\_WITH\_DEDICATED\_DISCOVERY” | type: ENUMmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: N/AisNullable: False |
| targetNFServiceList | This parameter lists target NF services sharing same communication model and configuration.allowedValues: N/A | type: DNmultiplicity: 1..\*isOrdered: FisUnique: N/AdefaultValue: NoneisNullable: False |
| commModelConfiguration | This parameter defines configuration parameters for specific communication model for a group of NF Services.allowedValues: N/A | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: N/AisNullable: False |
| supportedFuncList | This parameter lists functionalities supported by a SCP. Refer to TS 23.501 [2]. | type: SupportedFunctionmultiplicity: 1..\*isOrdered: N/AisUnique: FalsedefaultValue: NoneisNullable: False |
| Address | This parameter defines address of a SCP instance, it can be IP address (either IPv4 address (See RFC 791 [37]) or IPv6 address (See RFC 2373 [38])) or FQDN (See TS 23.003 [5]).  | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: N/AisNullable: False |
| Function | This parameter defines name of a functionality supported by a SCP. | type: Stringmultiplicity: 1isOrdered: FisUnique: N/AdefaultValue: NoneisNullable: False |
| Policy | This parameter defines configuration policies of a functionality supported by a SCP. | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: N/AisNullable: False |
| capabilityList | This parameter lists capabilities supported by a NEF. Refer to TS 23.501 [2].allowedValues: N/A | type: Stringmultiplicity: 1..\*isOrdered: N/AisUnique: FalsedefaultValue: NoneisNullable: False |
| isINEF | This parameter defines if the NEF is an Intermediate NEF. allowedValues: TRUE, FALSE | type: Booleanmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: N/AisNullable: False |
| isCAPIFSup | This parameter defines if the NEF support Common API Framework.allowedValues: TRUE, FALSE | type: Booleanmultiplicity: 1isOrdered: FisUnique: N/AdefaultValue: NoneisNullable: False |
| sEPPType | This parameter defines the type of a SEPP entity. Refer to TS 33.501 [52].allowedValues: “CSEPP”, “PSEPP” | type: ENUMmultiplicity: 1isOrdered: N/AisUnique: FalsedefaultValue: NoneisNullable: False |
| sEPPId | This parameter is identifier of a SEPP, it is unique inside a PLMN. allowedValues: N/A | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: N/AisNullable: False |
| remotePlmnId | This parameter defines PLMNId of the remote SEPP.allowedValues: N/A | Type: PLMNId multiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| remoteSeppAddress | This parameter defines address of the remote SEPP. It can be IP address (either IPv4 address (See RFC 791 [37]) or IPv6 address (See RFC 2373 [38])) or FQDN(See TS 23.003 [5]).allowedValues: N/A | type: Stringmultiplicity: 1isOrdered: FisUnique: N/AdefaultValue: NoneisNullable: False |
| remoteSeppId | This parameter defines identifier of the remote SEPP. it is unique inside a PLMN.allowedValues: N/A | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: N/AisNullable: False |
| n32cParas | This attribute is used to configure parameters to establish security link between two SEPPs. allowedValues: N/A | type: Stringmultiplicity: 1isOrdered: FisUnique: N/AdefaultValue: NoneisNullable: False |
| n32fPolicy | This attribute is used to configure policies to protect the messages exchanged between SEPPs.allowedValues: N/A | type: Stringmultiplicity: 1isOrdered: FisUnique: N/AdefaultValue: NoneisNullable: False |
| withIPX | This attribute defines if there’s an IPX interconnected between two SEPPs.allowedValues: TRUE, FALSE | type: Booleanmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: N/AisNullable: False |
| FiveQiDscpMappingList | It provides the list of mapping between 5QIs and DSCP.allowedValues: N/A | type: FiveQiDscpMappingmultiplicity: \*isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| fiveQIValues | It indicates a list of 5QI value.allowedValues: 0 - 255 | type: Integermultiplicity: \*isOrdered: N/AisUnique: YesdefaultValue: NoneisNullable: False |
| Dscp | It indicates a DSCP.allowedValues: 0 – 255 | type: Integermultiplicity: 1isOrdered: N/AisUnique: YesdefaultValue: NoneisNullable: False |
| configurable5QISetRef | This is the DN of Configurable5QISet. allowedValues: DN of the Configurable5QISet MOI. | type: Stringmultiplicity: 0..1isOrdered: FalseisUnique: TruedefaultValue: NoneisNullable: True |
|  |  |  |
| dynamic5QISetRef | This is the DN of Dynamic5QISet MOI. allowedValues: DN of the Dynamic5QISet MOI. | type: Stringmultiplicity: 0..1isOrdered: FalseisUnique: TruedefaultValue: NoneisNullable: True |
|  |  |  |
| fiveQIValue | It identifies the 5QI value.allowedValues: 0 – 255 | type: Integermultiplicity: 1isOrdered: N/AisUnique: YesdefaultValue: NoneisNullable: False |
| resourceType | It indicates the Resource Type of a 5QI, as specified in TS 23.501 [2].allowedValues: “GBR”, “Non-GBR” | type: ENUMmultiplicity: 1isOrdered: N/AisUnique: FalsedefaultValue: NoneisNullable: False |
| priorityLevel | It indicates the Priority Level of a 5QI, as specified in TS 23.501 [2].allowedValues: 0 - 127 | type: Integermultiplicity: 1isOrdered: N/AisUnique: FalsedefaultValue: NoneisNullable: False |
| packetDelayBudget | It indicates the Packet Delay Budget (in unit of 0.5ms) of a 5QI, as specified in TS 23.501 [2].allowedValues: 0 - 1023 | type: Integermultiplicity: 1isOrdered: N/AisUnique: FalsedefaultValue: NoneisNullable: False |
| packetErrorRate | It indicates the Packet Error Rate of a 5QI, as specified in TS 23.501 [2].allowedValues: N/A | type: PacketErrorRatemultiplicity: 1isOrdered: N/AisUnique: FalsedefaultValue: NoneisNullable: False |
| averagingWindow | It indicates the Averaging Window (in unit of ms) of a 5QI, as specified in TS 23.501 [2].allowedValues: 0 - 4095 | type: Integermultiplicity: 1isOrdered: N/AisUnique: FalsedefaultValue: NoneisNullable: False |
| maximumDataBurstVolume | It indicates the Maximum Data Burst Volume (in unit of Byte) of a 5QI, as specified in TS 23.501 [2].allowedValues: 0 - 4095 | type: Integermultiplicity: 1isOrdered: N/AisUnique: FalsedefaultValue: NoneisNullable: False |
| scalar | The Packet Error Rate of a 5QI expressed as *Scalar* x 10-k where k is the *Exponent*.This attriutes indicates the *Scalar* of this expression.allowedValues: 0 - 9 | type: Integermultiplicity: 1isOrdered: N/AisUnique: FalsedefaultValue: NoneisNullable: False |
| exponent | The Packet Error Rate of a 5QI expressed as *Scalar* x 10-k where k is the *Exponent*.This attriutes indicates the *Exponent* of this expression.allowedValues: 0 - 9 | type: Integermultiplicity: 1isOrdered: N/AisUnique: FalsedefaultValue: NoneisNullable: False |
| gtpUPathQoSMonitoringState | It indicates the state of GTP-U path QoS monitoring for URLLC service.allowedValues: "Enabled", "Disabled". | type: ENUMmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: EnabledisNullable: False |
| gtpUPathMonitoredSNSSAIs | It specifies the S-NSSAIs for which the GTP-U path QoS monitoring is to be performed. allowedValues: See 3GPP TS 23.003 [13] | type: S-NSSAImultiplicity: \*isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| monitoredDSCPs | It specifies the DSCPs for which the GTP-U path QoS monitoring is to be performed. allowedValues: See 3GPP TS 29.244 [56] | type: Integermultiplicity: \*isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| isEventTriggeredGtpUPathMonitoringSupported | It indicates whether the event triggered GTP-U path QoS monitoring reporting based on thresholds is supported, see 3GPP TS 29.244 [56].allowedValues: “Yes”, “No”. | type: Booleanmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: YesisNullable: False |
| isPeriodicGtpUMonitoringSupported | It indicates whether the periodic GTP-U path QoS monitoring reporting is supported, see 3GPP TS 29.244 [56].allowedValues: “Yes”, “No”. | type: Booleanmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: YesisNullable: False |
| isImmediateGtpUMonitoringSupported | It indicates whether the immediate GTP-U path QoS monitoring reporting is supported, see 3GPP TS 29.244 [56].allowedValues: “Yes”, “No”. | type: Booleanmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: YesisNullable: False |
| gtpUPathDelayThresholds | It specifies the thresholds for reporting the packet delay for the GTO-U path QoS monitoring, if the isEventTriggeredGtpUPathMonitoringSupported attribute of the same MOI is set to “yes”.The packet delay will be reported to SMF when it exceeds the threshold (in milliseconds).allowedValues: N/A. | type: GtpUPathDelayThresholdsTypemultiplicity: 1isOrdered: YisUnique: N/AdefaultValue: NoneisNullable: False |
| gtpUPathMinimumWaitTime | It specifies the minimum waiting time (in seconds) between two consecutive reports for event triggered GTP-U path QoS monitoring reporting, if the isEventTriggeredGtpUPathMonitoringSupported attribute of the same MOI is set to “yes”.allowedValues: see 3GPP TS 29.244 [56]. | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| gtpUPathMeasurementPeriod | It specifies the period (in seconds) for reporting the packet delay for GTP-U path QoS monitoring, if the isPeriodicGtpUMonitoringSupported attribute of the same MOI is set to “yes”.allowedValues: see 3GPP TS 29.244 [56]. | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| n3AveragePacketDelayThreshold | It specifies the threshold for reporting the average packet delay of a GTP-U path on N3 interface.allowedValues: see 3GPP TS 29.244 [56]. | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| n3MinPacketDelayThreshold | It specifies the threshold for reporting the minimum packet delay of a GTP-U path on N3 interface.allowedValues: see 3GPP TS 29.244 [56]. | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| n3MaxPacketDelayThreshold | It specifies the threshold for reporting the maxinum packet delay of a GTP-U path on N3 interface.allowedValues: see 3GPP TS 29.244 [56]. | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| n9AveragePacketDelayThreshold | It specifies the threshold for reporting the average packet delay of a GTP-U path on N9 interface.allowedValues: see 3GPP TS 29.244 [56]. | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| n9MinPacketDelayThreshold | It specifies the threshold for reporting the minimum packet delay of a GTP-U path on N9 interface.allowedValues: see 3GPP TS 29.244 [56]. | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| n9MaxPacketDelayThreshold | It specifies the threshold for reporting the maxinum packet delay of a GTP-U path on N9 interface.allowedValues: see 3GPP TS 29.244 [56]. | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| qFQoSMonitoringState | It indicates the state of QoS monitoring per QoS flow per UE for URLLC service.allowedValues: "Enabled", "Disabled". | type: ENUMmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: EnabledisNullable: False |
| qFMonitoredSNSSAIs | It specifies the S-NSSAIs for which the QoS monitoring per QoS flow per UE is to be performed. allowedValues: See 3GPP TS 23.003 [13] | type: S-NSSAImultiplicity: \*isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| qFMonitored5QIs | It specifies the 5QIs for which the QoS monitoring per QoS flow per UE is to be performed. allowedValues: See 3GPP TS 23.501[2] | type: Integermultiplicity: \*isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| isEventTriggeredQFMonitoringSupported | It indicates whether the event based QoS monitoring reporting per QoS flow per UE is supported, see 3GPP TS 29.244 [56].allowedValues: “Yes”, “No”. | type: Booleanmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: YesisNullable: False |
| isPeriodicQFMonitoringSupported | It indicates whether the periodic QoS monitoring reporting per QoS flow per UE is supported, see 3GPP TS 29.244 [56].allowedValues: “Yes”, “No”. | type: Booleanmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: YesisNullable: False |
| isSessionReleasedQFMonitoringSupported | It indicates whether the session release based QoS monitoring reporting per QoS flow per UE is supported, see 3GPP TS 29.244 [56].allowedValues: “Yes”, “No”. | type: Booleanmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: YesisNullable: False |
| qFPacketDelayThresholds | It specifies the thresholds for reporting the packet delay between PSA and UE for QoS monitoring per QoS flow per UE, if the isEventTriggeredQFMonitoringSupported attribute of the same MOI is set to “yes”.”.The packet delay will be reported by PSA UPF to SMF when it exceeds the threshold (in milliseconds).allowedValues: see 3GPP TS 29.244 [56]. | type: QFPacketDelayThresholdsTypemultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| qFMinimumWaitTime | It specifies the minimum waiting time (in seconds) between two consecutive reports for event triggered QoS monitoring reporting per QoS flow per UE, if the isEventTriggeredQFMonitoringSupported attribute of the same MOI is set to “yes”.allowedValues: see 3GPP TS 29.244 [56]. | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| qFMeasurementPeriod | It specifies the period (in seconds) for reporting the packet delay for QoS monitoring per QoS flow per UE, if the isPeriodicQFMonitoringSupported attribute of the same MOI is set to “yes”.allowedValues: see 3GPP TS 29.244 [56]. | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| thresholdDl | It specifies the threshold for reporting the DL packet delay between PSA UPF and UE.allowedValues: see 3GPP TS 29.244 [56]. | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| thresholdUl | It specifies the threshold for reporting the UL packet delay between PSA UPF and UE.allowedValues: see 3GPP TS 29.244 [56]. | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| thresholdRtt | It specifies the threshold for reporting the round-trip packet delay between PSA UPF and UE.allowedValues: see 3GPP TS 29.244 [56]. | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| predefinedPccRules | It specifies the predefined PCC Rules, see TS 25.503 [59].allowedValues: N/A | type: PccRulemultiplicity: 1..\*isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False  |
| pccRuleId | It identifies the PCC rule.allowedValues: N/A | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| flowInfoList | It is a list of IP flow packet filter information.allowedValues: N/A | type: FlowInformationmultiplicity: \*isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| applicationId | A reference to the application detection filter configured at the UPF.allowedValues: N/A | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| appDescriptor | It is the ATSSS rule application descriptor.allowedValues: see TS 29.571 [61]. | type: BitStringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| contentVersion | Indicates the content version of the PCC rule.allowedValues: N/A | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| precedence | It indicates the order in which this PCC rule is applied relative to other PCC rules within the same PDU session.allowedValues: 0..255. | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| afSigProtocol | Indicates the protocol used for signalling between the UE and the AF. The default value is "NO\_INFORMATION".allowedValues: “NO\_INFORMATION”, “SIP”. | type: ENUMmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: “NO\_INFORMATION”isNullable: False |
| isAppRelocatable | It indicates the application relocation possibility. The default value is "FALSE.allowedValues: “TRUE”, “FALSE”.  | type: Booleanmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| isUeAddrPreserved | It Indicates whether UE IP address should be preserved.The default value is "FALSE".allowedValues: “TRUE”, “FALSE”. | type: Booleanmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: “FALSE”isNullable: False |
| qosData | It contains the QoS control policy data for a PCC rule.allowedValues: N/A | type: QoSDatamultiplicity: \*isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| altQosParams | It contains the QoS control policy data for the Alternative QoS parameter sets of the service data flow. Only the "qosId" attribute, "5qi" attribute, "maxbrUl" attribute, "maxbrDl" attribute, "gbrUl" attribute and "gbrDl" attribute are applicable within the QosData data type. This data type represents an ordered list, where the lower the index of the array for a given entry, the higher the priority.allowedValues: N/A | type: QoSDatamultiplicity: \*isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| trafficControlData | It contains the traffic control policy data for a PCC rule.allowedValues: N/A | type: TrafficControlDatamultiplicity: \*isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| conditionData | It contains the condition data for a PCC rule.allowedValues: N/A | type: ConditionDatamultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| tscaiInputUl | It contains transports TSCAI input parameters for TSC traffic at the ingress interface of the DS-TT/UE (uplink flow direction).allowedValues: N/A | type: TscaiInputContainer multiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| tscaiInputDl | It contains transports TSCAI input parameters for TSC traffic at the ingress of the NW-TT (downlink flow direction).allowedValues: N/A | type: TscaiInputContainer multiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| flowDescription | It defines a packet filter for an IP flow.allowedValues: see TS 29.214 [62]. | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| ethFlowDescription | It defines a packet filter for an Ethernet flow.allowedValues: see TS 29.514 [62]. | type: EthFlowDescriptionmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| destMacAddr | It specifies the destination MAC address formatted in the hexadecimal notation according to clause 1.1 and clause 2.1 of IETF RFC 7042 [63].Pattern: '^([0-9a-fA-F]{2})((-[0-9a-fA-F]{2}){5})$'.allowedValues: N/A. | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| ethType | A two-octet string that represents the Ethertype, as described in IEEE 802.3 [64] and IETF RFC 7042 [63] in hexadecimal representation.Each character in the string shall take a value of "0" to "9" or "A" to "F" and shall represent 4 bits. The most significant character representing the 4 most significant bits of the ethType shall appear first in the string, and the character representing the 4 least significant bits of the ethType shall appear last in the string.allowedValues: see IEEE 802.3 [64] and IETF RFC 7042 [63]. | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| fDesc | It contains the flow description for the Uplink or Downlink IP flow. It shall be present when the ethtype is IP.allowedValues: see flowDescription in TS 29.214 [62]. | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| fDir | It indicates the packet filter direction. allowedValues: "DOWNLINK", "UPLINK".  | type: ENUMmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| sourceMacAddr | It specifies the source MAC address formatted in the hexadecimal notation according to clause 1.1 and clause 2.1 of IETF RFC 7042 [63].Pattern: '^([0-9a-fA-F]{2})((-[0-9a-fA-F]{2}){5})$'.allowedValues: N/A. | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| vlanTags | It specifies the Customer-VLAN and/or Service-VLAN tags containing the VID, PCP/DEI fields as defined in IEEE 802.1Q [65] and IETF RFC 7042 [63]. The first/lower instance in the array stands for the Customer-VLAN tag and the second/higher instance in the array stands for the Service-VLAN tag.Each field is encoded as a two-octet string in hexadecimal representation. Each character in the string shall take a value of "0" to "9" or "A" to "F" and shall represent 4 bits. The most significant character representing the PCP/DEI field shall appear first in the string, followed by character representing the 4 most significant bits of the VID field, and the character representing the 4 least significant bits of the VID field shall appear last in the string.If only Service-VLAN tag is provided, empty string for Customer-VLAN tag shall be provided.allowedValues: see IEEE 802.1Q [65] and IETF RFC 7042 [63]. | type: Stringmultiplicity: \*isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| srcMacAddrEnd | It specifies the source MAC address end. If this attribute is present, the sourceMacAddr attribute specifies the source MAC address start. E.g. srcMacAddrEnd with value 00-10-A4-23-3E-FE and sourceMacAddr with value 00-10-A4-23-3E-02 means all MAC addresses from 00-10-A4-23-3E-02 up to and including 00-10-A4-23-3E-FE.allowedValues: N/A. | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: True |
| destMacAddrEnd | It specifies the destination MAC address end. If this attribute is present, the destMacAddr attribute specifies the destination MAC address start.allowedValues: N/A. | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: True |
| packFiltId | It is the identifier of the packet filter.allowedValues: N/A. | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| packetFilterUsage | It indicates if the packet shall be sent to the UE. The default value is "FALSE".allowedValues: TRUE, FALSE | type: Booleanmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: “FALSE”isNullable: False |
| tosTrafficClass | It contains the Ipv4 Type-of-Service and mask field or the Ipv6 Traffic-Class field and mask field.allowedValues: N/A | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| spi | It is the security parameter index of the IPSec packet, see IETF RFC 4301 [66].allowedValues: see IETF RFC 4301 [66]. | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: True |
| flowLabel | It specifies the Ipv6 flow label header field.AllowedValues: N/A | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: True |
| flowDirection | It indicates the direction/directions that a filter is applicable.AllowedValues: “DOWNLINK”, “UPLINK”, “BIDIRECTIONAL”, “UNSPECIFIED”. | type: ENUMmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: True |
| qosId | It identifies the QoS control policy data for a PCC rule.AllowedValues: N/A | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| maxbrUl | It represents the maximum uplink bandwidth formatted as follows:Pattern: '^\d+(\.\d+)? (bps|Kbps|Mbps|Gbps|Tbps)$', see TS 29.512 [60].Examples:"125 Mbps", "0.125 Gbps", "125000 Kbps"AllowedValues: N/A | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: True |
| maxbrDl | It represents the maximum downlink bandwidth formatted as follows:Pattern: '^\d+(\.\d+)? (bps|Kbps|Mbps|Gbps|Tbps)$', see TS 29.512 [60].Examples:"125 Mbps", "0.125 Gbps", "125000 Kbps".AllowedValues: N/A. | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: True |
| gbrUl | It represents the guaranteed uplink bandwidth formatted as follows:Pattern: '^\d+(\.\d+)? (bps|Kbps|Mbps|Gbps|Tbps)$', see TS 29.512 [60].Examples:"125 Mbps", "0.125 Gbps", "125000 Kbps".AllowedValues: N/A. | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: True |
| gbrDl | It represents the guaranteed downlink bandwidth formatted as follows:Pattern: '^\d+(\.\d+)? (bps|Kbps|Mbps|Gbps|Tbps)$', see TS 29.512 [60].Examples:"125 Mbps", "0.125 Gbps", "125000 Kbps".AllowedValues: N/A. | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: True |
| extMaxDataBurstVol | It denotes the largest amount of data that is required to be transferred within a period of 5G-AN PDB, see TS 29.512 [60].AllowedValues: 4096..2000000. | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: True |
| arp | It indicates the allocation and retention priority.AllowedValues: N/A. | type: ARPmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| ARP.priorityLevel | It defines the relative importance of a resource request. AllowedValues: 1..15. | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| preemptCap | It defines whether a service data flow may get resources that were already assigned to another service data flow with a lower priority level. AllowedValues: "NOT\_PREEMPT", "MAY\_PREEMPT". | type: ENUMmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| preemptVuln | It defines whether a service data flow may lose the resources assigned to it in order to admit a service data flow with higher priority level.AllowedValues: "NOT\_PREEMPTABLE", "PREEMPTABLE". | type: ENUMmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| qosNotificationControl | It indicates whether notifications are requested from 3GPP NG-RAN when the GFBR can no longer (or again) be guaranteed for a QoS Flow during the lifetime of the QoS Flow. The default value is "FALSE".AllowedValues: "TRUE", "FALSE". | type: Booleanmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: “FALSE”isNullable: False |
| reflectiveQos | Indicates whether the QoS information is reflective for the corresponding non-GBR service data flow. The default value is "FALSE".AllowedValues: "TRUE", "FALSE". | type: Booleanmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: “FALSE”isNullable: False |
| sharingKeyDl | It indicates, by containing the same value, what PCC rules may share resource in downlink direction.AllowedValues: N/A. | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: True |
| sharingKeyUl | It indicates, by containing the same value, what PCC rules may share resource in uplink direction.AllowedValues: N/A. | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: True |
| maxPacketLossRateDl | It indicates the downlink maximum rate for lost packets that can be tolerated for the service data flow.AllowedValues: 0..1000. | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: True |
| maxPacketLossRateUl | It indicates the uplink maximum rate for lost packets that can be tolerated for the service data flow.AllowedValues: 0..1000. | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: True |
| tcId | It univocally identifies the traffic control policy data within a PDU session.AllowedValues: N/A. | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| flowStatus | It represents whether the service data flow(s) are enabled or disabled. The default value is "ENABLED". See TS 29.514 [67].AllowedValues: “ENABLED-UPLINK”, “ENABLED-DOWNLINK”, “ENABLED”, “DISABLED”, “REMOVED”.  | type: ENUMmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: “ENABLED”isNullable: False |
| redirectInfo | It indicates whether the detected application traffic should be redirected to another controlled address.AllowedValues: N/A. | type: RedirectInformationmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: “ENABLED”isNullable: False |
| addRedirectInfo | It contains the additional redirect information indicating whether the detected application traffic should be redirected to another controlled address.AllowedValues: N/A. | type: RedirectInformationmultiplicity: 1..\*isOrdered: N/AisUnique: N/AdefaultValue: “ENABLED”isNullable: False |
| redirectEnabled | It indicates whether the redirect instruction is enabled.AllowedValues: "TRUE", "FALSE". | type: Booleanmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| redirectAddressType | It indicates the type of redirect address, see TS 29.512 [60].AllowedValues: " IPV4\_ADDR", "IPV6\_ADDR", “URL”, “SIP\_URI”. | type: ENUMmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| redirectServerAddress | It indicates the address of the redirect server.AllowedValues: N/A. | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| muteNotif | It indicates whether applicat'on's start or stop notification is to be muted. The default value is "FALSE".AllowedValues: "TRUE", "FALSE". | type: Booleanmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: “FALSE”isNullable: False |
| trafficSteeringPolIdDl | It references to a pre-configured traffic steering policy for downlink traffic at the SMF, see TS 29.512 [60].AllowedValues: N/A. | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| trafficSteeringPolIdUl | It references to a pre-configured traffic steering policy for uplink traffic at the SMF, see TS 29.512 [60].AllowedValues: N/A. | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| routeToLocs | It provides a list of location which the traffic shall be routed to for the AF request.AllowedValues: N/A. | type: RouteToLocationmultiplicity: 1..\*isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| traffCorreInd | It indicates the traffic correlation.AllowedValues: "TRUE", "FALSE". | type: Booleanmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: “FALSE”isNullable: False |
| dnai | It represents the DNAI (Data network access identifier), see 3GPP TS 23.501 [2].AllowedValues: N/A. | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| routeInfo | It provides the traffic routing information.AllowedValues: N/A. | type: RouteInformationmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| ipv4Addr | It defines the Ipv4 address of the tunnel end point in the data network, formatted in the "dotted decimal" notation.Pattern: '^(([0-9]|[1-9][0-9]|1[0-9][0-9]|2[0-4][0-9]|25[0-5])\.){3}([0-9]|[1-9][0-9]|1[0-9][0-9]|2[0-4][0-9]|25[0-5])$'.AllowedValues: N/A. | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| ipv6Addr | It defines the Ipv6 address of the tunnel end point in the data network.Pattern: '^((:|(0?|([1-9a-f][0-9a-f]{0,3}))):)((0?|([1-9a-f][0-9a-f]{0,3})):){0,6}(:|(0?|([1-9a-f][0-9a-f]{0,3})))$'andPattern: '^((([^:]+:){7}([^:]+))|((([^:]+:)\*[^:]+)?::(([^:]+:)\*[^:]+)?))$'.AllowedValues: N/A. | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| portNumber | It defines the UDP port number of the tunnel end point in the data network, see TS 29.571 [61].AllowedValues: N/A. | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| routeProfId | It identifies the routing profile.AllowedValues: N/A. | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| upPathChgEvent | It contains the information about the AF subscriptions of the UP path change.AllowedValues: N/A. | type: UpPathChgEventmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| notificationUri | It provides notification address (Uri) of AF receiving the event notification.AllowedValues: N/A. | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| notifCorreId | It is used to set the value of Notification Correlation ID in the notification sent by the SMF, see TS 29.512 [60]. AllowedValues: N/A. | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| dnaiChgType | It indicates the type of DNAI change, see TS 29.512 [60].AllowedValues: “EARLY”, “EARLY\_LATE”, “LATE”. | type: ENUMmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| afAckInd | It identifies whether the AF acknowledgement of UP path event notification is expected.The default value is "FALSE".AllowedValues: “TRUE”, “FALSE”. | type: Booleanmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: “FALSE”isNullable: False |
| steerFun | It indicates the applicable traffic steering functionality, see TS 29.512 [60].AllowedValues: “MPTCP”, “ATSSS\_LL”. | type: ENUMmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| steerModeDl | It provides the traffic distribution rule across 3GPP and Non-3GPP accesses to apply for downlink traffic.AllowedValues: N/A. | type: SteeringModemultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| steerModeUl | It provides the traffic distribution rule across 3GPP and Non-3GPP accesses to apply for uplink traffic.AllowedValues: N/A. | type: SteeringModemultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| mulAccCtrl | It indicates whether the service data flow, corresponding to the service data flow template, is allowed or not allowed. The default value is "NOT\_ALLOWED".AllowedValues: "ALLOWED", "NOT\_ALLOWED". | type: ENUMmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: "NOT\_ALLOWED"isNullable: False |
| steerModeValue | It indicates the value of the steering mode, see TS 29.512 [60].AllowedValues: “ACTIVE\_STANDBY”, “LOAD\_BALANCING”, “SMALLEST\_DELAY”, “PRIORITY\_BASED”. | type: ENUMmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| active | It indicates the active access, see TS 29.571 [61].AllowedValues: "3GPP\_ACCESS", "NON\_3GPP\_ACCESS". | type: ENUMmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| standby | It indicates the Standby access, see TS 29.571 [61].AllowedValues: "3GPP\_ACCESS", "NON\_3GPP\_ACCESS". | type: ENUMmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| threeGLoad | It indicates the traffic load to steer to the 3GPP Access expressed in one percent. AllowedValues: 0..100. | type: Integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| prioAcc | It indicates the high priority access, see TS 29.571 [61].AllowedValues: "3GPP\_ACCESS", "NON\_3GPP\_ACCESS". | type: ENUMmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| condId | It uniquely identifies the condition data.AllowedValues: N/A. | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| activationTime | It indicates the time (in date-time format) when the decision data shall be activated, see TS 29.512 [60] and TS 29.571 [61].AllowedValues: N/A. | type: DateTimemultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| deactivationTime | It indicates the time (in date-time format) when the decision data shall be deactivated, see TS 29.512 [60] and TS 29.571 [61].AllowedValues: N/A. | type: DateTimemultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| accessType | It provides the condition of access type of the UE when the session AMBR shall be enforced, see TS 29.512 [60].AllowedValues: "3GPP\_ACCESS", "NON\_3GPP\_ACCESS". | type: ENUMmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| ratType | It provides the condition of RAT type of the UE when the session AMBR shall be enforced, see TS 29.512 [60] and TS 29.571 [61].AllowedValues: "NR", "EUTRA", “WLAN”, “VIRTUAL”, “NBIOT”, “WIRELINE”, “WIRELINE\_CABLE”, “WIRELINE\_BBF”, “LTE-M”, “NR\_U”, “EUTRA\_U”, “TRUSTED\_N3GA”, “TRUSTED\_WLAN”, “UTRA”, “GERA”. | type: ENUMmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| periodicity | It identifies the time period between the start of two bursts in reference to the TSN GM.AllowedValues: see TS 29.571 [61]. | type: integermultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| burstArrivalTime | Indicates the arrival time (in date-time format) of the data burst in reference to the TSN GM. AllowedValues: see TS 29.571 [61]. | type: DateTimemultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |

|  |
| --- |
| **Next modified section** |

### 5.3.76 FiveQICharacteristics

#### 5.3.76.1 Definition

This specifies the 5QI value and the corresponding QoS characteristics for a 5QI.

#### 5.3.76.2 Attributes

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Support Qualifier | isReadable | isWritable | isInvariant | isNotifyable |
| fiveQIValue | M | T | T/F (NOTE) | F | T |
| resourceType | M | T | T/F (NOTE) | F | T |
| priorityLevel | O | T | T/F (NOTE) | F | T |
| packetDelayBudget | O | T | T/F (NOTE) | F | T |
| packetErrorRate | O | T | T/F (NOTE) | F | T |
| averagingWindow | O | T | T/F (NOTE) | F | T |
| maximumDataBurstVolume | O | T | T/F (NOTE) | F | T |
| NOTE: The isWritable qualifier is "T" if the attribute 1) describes a 5QI in Configurable5QISet MOI, or 2) describes a 5QI in Dynamic5QISet MOI which is associated to PCFFunction MOI or SMFFunction MOI when the PCF is not deployed; The isWritable qualifier is "F" otherwise. |

#### 5.3.76.3 Attribute constraints

None

#### 5.3.76.4 Notifications

The common notifications defined in subclause 5.5 are valid for this IOC, without exceptions or additions.

|  |
| --- |
| **Next modified section** |

The Figure 5.2.1.1-17 shows the NRM fragment for pre-configured 5QIs in 5GC.



Figure 5.2.1.1-17: NRM fragment for pre-configured 5QIs in 5GC

|  |
| --- |
| **Next modified section** |

## H.5.30 module \_3gpp-5gc-nrm-Configurable5QISet.yang

module \_3gpp-5gc-nrm-configurable5qiset {

 yang-version 1.1;

 namespace urn:3gpp:sa5:\_3gpp-5gc-nrm-configurable5qiset;

 prefix Conf5QIs3gpp;

 import \_3gpp-common-top { prefix top3gpp; }

 import \_3gpp-common-managed-element { prefix me3gpp; }

 import \_3gpp-common-subnetwork { prefix subnet3gpp; }

 organization "3gpp SA5";

 contact "https://www.3gpp.org/DynaReport/TSG-WG--S5--officials.htm?Itemid=464";

 description "This IOC represents the non-standardized 5QIs, including

 their QoS characteristics, that need to be pre-configured

 (and configurable) to the 5G NFs.";

 reference "3GPP TS 28.541";

 revision 2020-08-03 { reference "CR-0321"; }

 revision 2020-06-03 { reference "CR-0286"; }

 grouping PacketErrorRate {

 leaf scalar {

 type uint32 {

 range 0..9 ;

 }

 mandatory true;

 description "The Packet Error Rate of a 5QI expressed as Scalar x 10-k

 where k is the Exponent.";

 }

 leaf exponent {

 type uint32 {

 range 0..9 ;

 }

 mandatory true;

 description "The Packet Error Rate of a 5QI expressed as Scalar x 10-k,

 where k is the Exponent.";

 }

 }

 grouping FiveQICharacteristicsGrp{

 description "Represents the FiveQICharacteristics IOC.";

 reference "3GPP TS 28.541”;

}

list configurableFiveQIs {

 key fiveQIValue;

 type uint32 {

 range 0..255 ;

 }

 mandatory true;

 description "Identifies the 5QI value.";

 }

 leaf resourceType {

 type enumeration {

 enum GBR;

 enum NON\_GBR;

 }

 mandatory true;

 description "It indicates the Resource Type of a 5QI, as specified

 in TS 23.501 ";

 }

 leaf priorityLevel {

 type uint32 {

 range 0..127 ;

 }

 }

 leaf packetDelayBudget {

 type uint32 {

 range 0..1023 ;

 }

 description "Indicates the Packet Delay Budget (in unit of 0.5ms)of a 5QI,

 as specified in TS 23.501 ";

 }

 list packetErrorRate {

 key "scalar exponent";

 min-elements 0;

 max-elements 1;

 uses PacketErrorRate;

 reference "TS 23.501";

 }

 leaf averagingWindow {

 type uint32 {

 range 0..4095 ;

 }

 units ms;

 reference "TS 23.501";

 }

 leaf maximumDataBurstVolume {

 type uint32{

 range 0..4095 ;

 }

 units byte;

 }

}

 grouping FiveQiCharacteristicsSubtree {

 description "Represents the FiveQICharacterics IOC.";

 list FiveQICharacteristics {

 key id;

 uses top3gpp:Top\_Grp;

 container attributes {

 uses FiveQICharacteristicsGrp;

 }

 }

}

 grouping Configurable5QISetGrp {

 description "Represents the Configurable5QISet IOC.";

 list configurable5QIs {

 key id;

 uses top3gpp:Top\_Grp;

 container attributes {

 uses FiveQICharacteristicsGrp;

 }

 }

}

 grouping Configurable5QISetSubtree {

 list Configurable5QISet {

 description "Specifies the non-standardized 5QIs, including their QoS

 characteristics, that need to be pre-configured (and configurable) to

 the 5G NFs, see 3GPP TS 23.501.";

 key id;

 uses top3gpp:Top\_Grp;

 container attributes {

 uses Configurable5QISetGrp;

 }

 }

 }

 augment "/subnet3gpp:SubNetwork" {

 uses Configurable5QISetSubtree;

 }

 augment "/me3gpp:ManagedElement" {

 uses Configurable5QISetSubtree;

 }

}

|  |
| --- |
| **Next modified section** |

## H.5.33 module \_3gpp-5gc-nrm-dynamic5QISet@2020-08-06.yang

module \_3gpp-5gc-nrm-dynamic5qiset {

 yang-version 1.1;

 namespace urn:3gpp:sa5:\_3gpp-5gc-nrm-dynamic5qiset;

 prefix dyn5QIs3gpp;

 import \_3gpp-common-top { prefix top3gpp; }

 import \_3gpp-common-subnetwork { prefix subnet3gpp; }

 import \_3gpp-common-managed-element { prefix me3gpp; }

 import \_3gpp-5gc-nrm-configurable5qiset { prefix Conf5QIs3gpp; }

 organization "3gpp SA5";

 contact "https://www.3gpp.org/DynaReport/TSG-WG--S5--officials.htm?Itemid=464";

 description "This IOC represents the dynamic 5QIs including their QoS

 characteristics.";

 reference "3GPP TS 28.541";

 revision 2020-09-30 { reference "CR-0393"; }

 revision 2020-08-06 { reference "CR-0333"; }

 grouping Dynamic5QISetGrp {

 description "Represents the Dynamic5QISet IOC.";

 list dynamic5QIs {

 key id;

 uses top3gpp:Top\_Grp;

 container attributes {

 uses Conf5QIs3gpp:FiveQICharacteristicsGrp;

 }

 }

 }

 grouping Dynamic5QISetSubtree {

 description "Helps augmenting Dynamic5QISet into multiple places.";

 list Dynamic5QISet {

 description "Specifies the dynamic 5QIs including their QoS

 characteristics, see 3GPP TS 23.501.";

 key "id";

 uses top3gpp:Top\_Grp;

 container attributes {

 uses Dynamic5QISetGrp;

 }

 }

 }

 augment "/subnet3gpp:SubNetwork" {

 uses Dynamic5QISetSubtree;

 }

 augment "/me3gpp:ManagedElement" {

 uses Dynamic5QISetSubtree;

 }

}

|  |
| --- |
| **End of modified section** |